New Zealand National Report: Ecologically Related Species in the New Zealand Southern Bluefin Tuna Longline Fishery, 2004–05 to 2005-06

June 2007

1. Introduction

Since the start of New Zealand's domestic southern bluefin tuna (SBT) fishery, handline, trolling and longline have been used to target SBT in the NZ EEZ. In recent years nearly all of the SBT catch has been by surface longline with occasional small catches by trolling and a small bycatch in the mid-water trawl fishery for hoki. Until recently the domestic fishery was composed of a wide range of vessel types including many small owner-operated boats, a few large low temperature longliners purchased overseas and 2-4 large low temperature Japanese-operated distant water longliners chartered by a New Zealand company. Both the chartered vessels and the New Zealand owner-operated vessels fished competitively against New Zealand's SBT catch allocation until 1 October 2004.

SBT is seasonally present in New Zealand from March/April to August/September. Fishing takes place in two areas, off the east coast of the North Island north of 42^{o} S and off the west coast of the South Island south of 42^{o} S. The distribution of SBT catches by month and latitude in 2003/04 is shown in Figure 1. Figure 1 indicates that the season was somewhat earlier and larger catches were taken off the west coast than off the east coast in 2003/04.

Domestic owner-operator vessels operate throughout the year. These vessels target albacore during January to March in waters to the north of New Zealand, then move south to target southern bluefin and bigeye tunas north of about 40° S. Since 1991–92, most vessels fishing in New Zealand waters have voluntarily undertaken to set lines at night. The use of tori lines became mandatory in 1993. Night setting became mandatory in 2007. Some vessels operate under a voluntary code of practice relating to catch size, fishing strategy, and bycatch.

Japanese charter vessels operate mainly during March to June in waters around southern New Zealand, targeting southern bluefin tuna. Until the late 1990s, these vessels moved north during July-August to target southern bluefin and bigeye tunas north of about 38° S. In recent years, vessels in these northern waters have expended less effort, in part, because of the increased likelihood of catching seabirds in this area. This fleet follows a voluntary code of practice that includes, amongst other measures, a limit on the allowable capture of certain "at-risk" seabird species, most of which tend to be caught in northern waters.

Non-target fish species such as sharks, Ray's bream, albacore and dealfish are caught in large numbers as bycatch on tuna longlines. Eight taxa of seabirds were recorded as bycatch during 2005 and 2006, with conservation status of the species ranging from rare to abundant. This was a reduction from 11 taxa in the preceding two years. New Zealand fur seals were captured during fishing for SBT during 2003 and 2004, most of which were released alive. 18 fur seals were captured in 2005 and 12 in 2006. Occasional captures of whales have also been reported and these were released alive.

2. Review of SBT Fisheries in the New Zealand Exclusive Economic Zone

Fleet size and distribution

Annual Fleet Size and Distribution

Longline fishing targeting SBT primarily occurs off the west coast of the South Island south of 42º S and along the east coast of the North Island north of 42º S. SBT is also an important bycatch species in the bigeye target fishery in the Bay of Plenty. Figure 2 shows the position of all longline sets targeting SBT in 2003/04 (charter and owner-operator vessels combined). In 2003/04 longline fishing was generally more broadly spread than in most years with target fishing spread south along the Wairarapa coast, north into the Bay of Plenty, and the North Taranaki Bight off the west coast of the North Island.

The total number of longliners fishing in 2005 and 2006 was 57 and 65 vessels respectively, most of which were small longliners (< 50 GRT). This included two large (> 200 GRT) Japanese flag longline vessels that operated during the SBT season under a charter arrangement.

Historical Fleet Size and Distribution

The New Zealand SBT fishery began off the west coast of the South Island as a winter small boat handline and troll fishery in the early 1980s. Most fishing by these vessels was in July and August. Since 1990, however, these methods have comprised only a minor component of the fishery as longline vessels had generally caught the SBT quota by the time the handline fishery started.

During the 1980s to mid-1990s most longlining was conducted by foreign licensed longliners from Japan. However, declining catch rates, shortened seasons of availability and reports of increased operating costs in the EEZ resulted in the foreign licensed fleet ceasing operations in 1995. Domestic longlining began in 1991 and steadily increased to over 150 vessels in 2002 before declining in 2003 (132 vessels) and again in 2006 (56 vessels).

Distribution of Catch and Effort

Almost all the NZ catches are taken by longline though small amounts of SBT continue to be caught by trolling, and as bycatch in the mid-water trawl fishery (1.1 to 5.8 t per year). Total SBT catches are summarised by calendar year and fishing year (1 October to 30 September) in Table 2.

The charter fleet primarily operates off the west coast of the South Island while smaller domestic owned and operated vessels primarily operate off the east coast of the North Island. The fishing season for SBT is essentially the same for both areas and begins in March/April and finishes when the quota is reached usually in June/July.

Summary
Since major changes in the early 1990s to the fleet composition, the most major change to fishing activities for SBT fisheries in New Zealand was coincident with the introduction of SBT into the New Zealand Quota Management System. This has been evidenced by reduction in the domestic fleet size by around 50%. Catches continue to be taken in the two main fishery areas in the Northeast and Southwest of the New Zealand EEZ. Up until 2004, catches of SBT were relatively stable around the national allocation of 420 tonnes, but in the past two years catches have declined dramatically to the mid-200 tonne level.

3. Fisheries Monitoring

Observer coverage

Observer coverage has been nearly 100% in the charter fleet for several years. However, the small size of domestic owned and operated vessels and short trips has made it difficult for the Ministry of Fisheries (MFish) to realise the 10% target for observer coverage in this fleet. In 2004 and 2005, the target level of 10% coverage of the catch was been achieved but this was not the case in 2006.

All sets from the Japanese Charter fleet were observed, though only about 93% of hooks were observed during the hauling phase due to observers taking breaks during the long hauling period on these vessels. In spite of reductions in effort for the domestic fleet, total observed effort increased for this fleet to 14% of total effort in 2003-04. It should be noted that because of the full observer coverage of the one large domestic vessel in the New Zealand fleet that fished in the southern fishery, the domestic observer coverage was not fully representative of the fleet. This absence (2002-03) and very low (2003-04) observer coverage in the north has lead to problems in accurately estimating catch levels from observer data for this fleet. Realignment of MFish observer allocation has resulted in continued improvements in coverage of domestic owned and operated longline vessels. Coverage by vessel was 100% in 2005 for Japanese Charter vessels, and 20% for domestic vessels. In 2006 coverage for the two fleets by vessel was 100% and 14% respectively. Observation of effort in 2005 was 88% of hooks for Japanese Charter vessels and 9% of domestic effort. In 2006, 87% and 6 % of hooks were observed for the two fleets, respectively. Observer coverage on vessels using handline or trolling is not done because the contribution of these methods to the total catch is negligible.

Observer collection of information

Biological information
Observers from the MFish Scientific Observer Programme are responsible for collecting biological data on SBT and bycatch data for catch characterisation. In 2003/04, 2007 SBT were measured for length (out of 2063 observed), otoliths were collected from 1140 SBT and observers recovered 5 tags (3 CSIRO dart tags, 1 CSIRO archival tag, and 1 CCSBT dart tag). In addition, observers tagged six SBT with Mk9 archival tags. Tag recovery data was provided to each tagging agency. Otoliths are stored at the National Institute of Water and Atmosphere (NIWA) and this year nearly 200 SBT otoliths collected in 2001 through 2004 were aged. Length,

weight (both processed and whole weights) and sex are recorded regularly for SBT and all major fish bycatch species. An update of further SBT tagging will be provided to the SAG/SC later in 2007.

Fish bycatch estimates
Data from the Observer Programme is used to quantify the extent of fish bycatch caught on tuna longlines in New Zealand waters. These data provide information on which species appeared as bycatch, the CPUE of the most common species, and estimates of total catch.

Catch monitoring

SBT

Prior to 1 October 2004, MFish operated an in-season catch monitoring system for SBT. This system required that on-shore processing companies and freezer vessels (including all of the chartered fleet) report their catch by e-mail or fax during the season to MFish. Weekly reporting was required once 25% of the catch allocation was reached and daily reporting required when 50% of the catch allocation had been reached. Reports were collated and analysed by MFish with the season being closed as close as possible to reaching our national allocation. All SBT permit holders were then notified that the season was closed and that it would be an offence to take southern bluefin tuna for the remainder of the fishing year.

From 1 October 2004, when SBT was introduced into the NZ quota management system (QMS), the catch monitoring and catch balancing systems in place for all other NZ quota species were applied to SBT. All fishers are required to furnish monthly returns of catch and these are then matched to individual holdings of quota entitlement. Financial penalties will apply to fishers (on a monthly basis) who catch southern bluefin tuna other than under the authority of quota. Fishers have the opportunity to reconcile their catch and quota entitlements up until the end of the fishing year and if they do not do so the financial penalties increase. The total fishery catches will be assessed annually and adjustment to future catch limits will be made to account for any annual overcatch as required

Fish Bycatch

Quota species

The main fish species associated with the SBT fishery within the NZ EEZ were also introduced into the QMS on 1 October 2004. As for SBT, all fishers are required to furnish monthly returns of catch of these associated species. Included in the monthly returns is area of harvest and effort information. Financial penalties apply to fishers who do not furnish returns, do not hold quota entitlement, or whose catch exceed their entitlements.

The total allowable commercial catch and recent catches of each of the main fish bycatch species associated with New Zealand's SBT longline fishery is presented in Table 2.

Non-quota species

There are a number of species caught as bycatch in the SBT fishery that are not managed under the QMS, such as albacore and striped marlin. However, fishers are required to report the catch of all species, including any non-QMS species, when furnishing their monthly returns. As a result, the commercial reporting requirements provide information on total catch and effort of fish bycatch in the SBT fishery.

4. Seabirds

Domestic and chartered Japanese vessels targeted SBT predominantly during April–August: thus, two seasons are reported here — the 2005 and 2006 seasons within the 2004–05 and 2005–06 fishing years. Fishery statistics reported in relation to seabird captures include only those fishing events targeting SBT, and therefore fisheries statistics may differ slightly from those available in other fora where data include all events where SBT was targeted or caught. Locations of captures for charter vessels were in the Southwest of the New Zealand EEZ (Area 3), whereas domestic fishers mainly fished in the Northeast (Area 1) (Table 3 & Figure 3).

Captures of seabirds in the 2005 and 2006 SBT fishery in the New Zealand EEZ are detailed. These include seabirds that were landed dead and those caught, then released alive. The ratio estimator was used and scaled to the total effort for each fleet and area stratum to provide total estimates of seabird captures; capture rates and estimates are given in Table 4. Table 5 provides numbers of the seabird taxa for those seabirds landed dead and returned for autopsy during 2005 - 2006.

Seabird incidental captures in the domestic SBT fishery in 2005 & 2006

Observers reported 3 seabirds from the domestic SBT fishery in 2005 and 14 in 2006 fishing years (Table 3). Observers covered 20% of domestic vessels and 9% of sets and hooks during 2005 and 14% of vessels and 6% of hooks during the 2006 season.

In the main fishery area, capture rates were 0.034 seabirds per 1000 hooks in 2005 and 0.239 seabirds per 1000 hooks in 2006. The low coverage and small number of seabird captures resulted in uncertain estimates of 33 seabirds (c.v. = 55%) in 2005 and 218 seabirds (c.v. = 41%) in 2006 (Table 4).

Seabird incidental captures in the Japanese charter SBT fishery in 2005 & 2006

Observers reported 35 seabirds from the chartered SBT fishery in 2004–05 and 15 in 2005–06 fishing years (Table 3). Only two vessels were present in this fishery and all sets were observed on both vessels: about 88% of the hooks were observed in each season.

Fishing was concentrated in southern waters (see Figure 3), and the capture rates here were 0.061 seabirds per 1000 hooks in 2005 and 0.026 seabirds in the 2006 season. Capture rates in northern waters were 0.069 seabirds per 1000 hooks in 2005 and 0.093 seabirds in 2006. A total of 40 seabirds (c.v. = 8%) was estimated for 2005 and 18 seabirds (c.v. = 13%) for 2006.

5. Other Non-Target Fish

This section summaries paper CCSBT-ERS/0602/6 as a full analysis of fish bycatch data was not undertaken in 2007, but will available for the next ERSWG. The species most commonly caught in tuna longline sets that either targeted or caught SBT were Ray's bream (*Brama brama*), blue shark (*Prionace glauca*), albacore(*Thunnus alalunga*) and dealfish (*Trachipterus trachypterus*). Other non-target fish of importance caught in large numbers were deepwater dogfish (Squaliformes of various species), rudderfish (*Centrolophus niger)* and porbeagle shark (*Lamna nasus)*. Smaller amounts of school shark (*Galeorhinus galeus*), moonfish (*Lampris guttatus*), mako shark (*Isurus oxyrinchus)*, thresher shark (*Alopias vulpinus)*, swordfish (*Xiphias gladius)*, butterfly tuna (*Gasterochisma melampus),* lancetfish (*Alepisaurus ferox & A. brevirostris),* oilfish (*Ruvettus pretiosus)* and hoki *(Macruronus novaezelandiae)* were also caught.

Bycatch composition from the Japanese charter fleet and the domestic fleet is quite different. This is likely due to differences in waters fished, with the Japanese charter fleet mostly operating in southern waters, and the domestic vessels fishing primarily in waters north of about 40^{o}S. In both 2002-03 and 2003-04, the Japanese charter fleet mostly caught Ray's bream and blue shark. In contrast, albacore dominated domestic fleet catches. While Ray's bream and blue shark were common in domestic catches as they were in the Japanese charter fleet catches, oilfish, swordfish and moonfish are far more common in the domestic catches.

Observers onboard both the Japanese charter and domestic fleets reported on both fish that were caught and subsequently discarded, and fish that were lost before they could be bought aboard the vessel. For the discarded fish, observers also recorded whether they were discarded alive or dead.

In 2002-03 and 2003-04, the highest numbers of discards were Ray's bream, blue shark and dealfish. Most of the lancetfish, deepwater dogfish, rudderfish, and dealfish caught were subsequently discarded (ranging from 76% to 100% across species and fleets). Ray's bream were discarded less than half the time and the tunas and swordfish were seldom discarded. There were some differences between the domestic and Japanese charter fleet, with the domestic fleet far more likely to discard sharks.

Most discards were alive, and the most discarded species by number had relatively low rates of dead discards, e.g. Ray's bream and the pelagic sharks. Tunas were generally discarded when they were dead (and typically damaged). Dealfish were typically discarded dead, and this combined with the relatively high rate of discarding for this species suggests that it is considered of little value to the longline fleet. The relatively high discard rates of pelagic sharks in the domestic fishery, in particular live discards, indicates a general practice across this fleet which should act to reduce the impact of the fishery on sharks.

6. Marine Mammal and Marine Reptile Bycatch

Marine mammals

Ninety-six New Zealand fur seals (*Arctocephalus forsteri)* were captured during fishing for southern bluefin tuna during 2003 and 2004. Of the 18 caught in 2005, 16 were released alive and 2 dead; in 2006 all 12 were released alive. Ninety-three of these were released alive in 2003 and 2004. No whales were caught in 2005 and 2006. One whale of unspecified species was also caught and released alive.

Marine reptiles

No marine reptiles were reported caught in 2003 - 2006.

7. Mitigation Measures to Minimise Seabird and Other Species Bycatch

Current measures

Mandatory measures for each fleet

Tori lines are the only mandatory mitigation measure in place to avoid capture of non-fish species for tuna longliners in New Zealand waters. The use of tori lines was regulated in 1993. Specifications of the required minimum tori line refer to its length and attachment point, as well as the number, size and distance between streamers.

Government observers monitor tori line deployment when they are assigned to vessels in longline fleets, including those targeting tuna species. Observer coverage targeting domestic tuna fishers is lower than for charter fleets, but anecdotal reports suggest that at least some fishers do not deploy tori lines when setting at night. In the charter fleet, observers report use of tori lines on all vessels.

In 2007, following large catches of threatened albatross species in pelagic longline fishing in Northern New Zealand in November 2006, additional measures were introduced to reduce the likelihood of seabird captures. These were compulsory night setting and specification of an additional tori line (Fisheries (Seabird Sustainability Measures) Notice 2007 (No. F393).

Voluntary measures for each fleet

Voluntary mitigation measures stipulated in any formal way are done so through Codes of Practice. There is currently no Code of Practice recognised for domestic tuna vessels. For charter vessels operated through the New Zealand Japan Tuna Co. Ltd., a Code of Practice is in place that stipulates:

- Night setting and potential need for extra mitigation devices over full moon periods
- Use of at least one tori line that meets government specifications, with preferably another tori line in use simultaneously
- Availability of back-up tori lines ready for immediate use if needed
- Offal discharge from the port side only

- Use of thawed bait only
- Reduced deck lighting at night
- Use of a sonic gun and 'bird frighteners'
- A catch limit for 'at risk' species of birds

In addition, vessels are encouraged to try out mitigation methods they believe may be effective.

Measures under development

Blue-dyed bait

In 2004, a pilot experiment was undertaken to test the potential effect of blue-dyed bait on incidental seabird mortalities and on fish catch rates in the New Zealand domestic tuna longline fishery (Lydon and Starr 2004). The East Cape region on the east coast of the North Island of New Zealand was chosen as the area to conduct the experiment because fisheries in this area are known to have a relatively high rate of interactions with seabirds and this high rate potentially would maximise the probability of observing encounters between fishing gear and seabird species.

Seven longline sets were observed over an eleven day trip. A total of 10,040 hooks were set, 4,999 of which held control baits (undyed squid) and the other 5,041 hooks held blue-dyed squid. Two juvenile male Antipodean wandering albatross (*Diomedea antipodensis*) were caught in the first set on the control bait section of the longline, but no bird strikes were observed for the remainder of the experiment. In a report on the experiment, observations on how dyed bait affects seabird interactions with the longline are reported and recommendations are made for future research. An aversion response by seabirds, rather than a camouflage effect of bait, is put forward as a possible mechanism for how the use of blue-dyed bait might reduce the attractiveness of longline baited hooks.

Fish oil

In 2004/05, the efficacy of shark liver oil in reducing seabird bycatch was examined. This possible solution to seabird – fisheries interactions was proposed by a New Zealand longline fisherman (http://www.birdlife.org/news/features/2004/04/albatross_comp.html), and involved dripping school shark *Galeorhinus galeus* liver oil on the ocean surface behind fishing vessels. A pilot study of the efficacy of shark liver oil in reducing the numbers of seabirds attending fishing vessels and the number of dives seabirds executed in pursuit of pilchard *Sardinops neopilchardus* baits was conducted (Pierre and Norden, unpublished).

Trials were conducted in northern New Zealand where seabird assemblages include the globally vulnerable black petrel *Procellaria parkinsoni*. Shark liver oil was effective in reducing both seabird numbers and dives on baits, compared to canola oil and seawater control treatments. Comparisons of seabird responses to shark liver oil and vegetable oil suggest that shark liver oil acts as an olfactory deterrent for seabirds. Further work should include testing the oil with additional seabird species and investigating habituation of seabirds to the oil in order to assess wider opportunities for long-term use of shark liver oil to reduce seabird bycatch.

8. Public Relations and Education Activities

Southern Seabird Solutions was formed in 2002, continued their work in education and awareness of seabird conservation through the inter-sessional period. For 2006, this group contributed to understanding about mitigation in trawl fisheries, by running a government and industry workshop on this subject.

9. Information on other ERS (non-bycatch) such as prey and predator species.

Since 1994, MFish observers aboard tuna longline vessels in New Zealand waters have recorded data on stomach contents of fish taken in longline operations. A preliminary examination of these data has been made for SBT and eight other ecologically related species. Proportions of empty stomachs did not appear to show significant trends through time for any of the nine species, but did vary among species. Observers reported that for most samples, only one prey type was evident in the stomach. Prey-type occurrence appeared to differ between the species. Sampling protocols may account for these findings. The full report is provided as CCSBT-ERSWG document: CCSBT-ERS/0602/8 and has not been updated in 2007, but will be for the next ERSWG.

10. Others

New Zealand has no information to report that it has obtained concerning ERS related fishing activities of non-party fleets.

11. Implementation of the IPOA-Seabirds and IPOA-Sharks

NOTE: NZL suggests that this new section be added to the standard reporting format for National Reports to ERS in future.

National Plan of Action to Reduce the Incidental Catch of Seabirds in New Zealand Fisheries

The NPOA is the principal framework for mitigating the impact of fisheries mortalities on seabirds. Its purpose is to set out a long-term strategy to reduce the incidental catch of seabirds in New Zealand fisheries. The Minister of Conservation and the Minister of Fisheries jointly approved the NPOA in April 2004. It is undergoing review after 3 years of operation.

The goals of the NPOA are:

- To ensure that the long-term viability of protected seabird species is not threatened by their incidental catch in New Zealand fisheries waters or by New Zealand flagged vessels in the high seas; and

- To further reduce incidental catch of protected species as far as possible, taking into account advances in technology, knowledge and financial

implications.

National Plan of Action Sharks

New Zealand will be consulting with stakeholders in June 2007 on a NPOA-sharks for New Zealand fisheries waters. A number of management actions have been taken in recent years to ensure the sustainable management of NZ shark fisheries outside of the context of the NPOA. These include introducing a range of shark species into the QMS and providing complete protection for some vulnerable species. For example great white sharks have recently been accorded protected species status in New Zealand.

Literature Cited

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Lydon, G. and Starr, P 2004. Effect of blue dyed bait on incidental seabird mortalities and fish catch rates on a commercial longliner fishing off East Cape, New Zealand. Department of Conservation, Wellington, New Zealand. http://www.doc.govt.nz/Conservation/Marine-and Coastal/Fishing/010~Conservation-services-programme/pdf/Effect-of-blue-dyed-bait1.pdf

Pierre, J. P. and Norden, W.S. unpublished report. Reducing seabird bycatch in longline fisheries using a natural olfactory deterrent.

Table 1 New Zealand southern bluefin tuna catches (tonnes) by calendar year and fishing year (1 October to 30 September).

Fish species	Catches (tones)	Catch limit (tonnes)
Albacore tuna	2 624	NA
Bigeye tuna	177	740
Yellowfin tuna	9	358
Pacific bluefin tuna	21	120
Swordfish	551	919
Moonfish	79	527
Blue shark	656	2080
Mako shark	82	512
Porbeagle shark	55	249
Ray's bream	215	1045

Calendar year	t.	Fishing year	t.
1980	130		
1981	173		
1982	305		
1983	132		
1984	93		
1985	94		
1986	82		
1987	59	1986/87	60
1988	94	1987/88	94
1989	437	1988/89	437
1990	529	1989/90	529
1991	164	1990/91	165
1992	279	1991/92	279
1993	217	1992/93	216
1994	277	1993/94	277
1995	436	1994/95	435
1996	139	1995/96	140
1997	334	1996/97	333
1998	337	1997/98	331
1999	461	1998/99	458
2000	380	1999/00	381
2001	358	2000/01	362
2002	463	2001/02	452
2003	389	2002/03	388
2004	393	2003/04	397
2005	264	2004/05	264
2006	238	2005/06	238

Table 2. Catches and commercial catch limits of the main fish bycatch species associated with the SBT surface longline fishery within the NZ EEZ (2005/06).

Table 3: Comparison of number of vessels and number of total hooks ($x10^3$) set with number of observed vessels and number of observed hooks ($x10^3$) for the surface longline fishery where the target reported was SBT, by areas shown in Figure 1, for the 2005 and 2006 seasons. Note that the number of vessels defined here is based on only those vessels to catch SBT in 2005 and 2006.

Number	Area 1	Area 2	Area 3	Area 4	Total
2005					
Chartered Japanese vessels					
Vessels	2	0	2	0	2
Observed vessels	2	–	2	–	2
% vessels observed	100	–	100	–	100
Total sets	42	–	157	–	199
Observed sets	42	–	157	–	199
% sets observed	100	–	100	–	100
Total hooks x 10^3	137.590	–	504.484	–	642.074
Observed hooks	116.655	–	446.170	–	562.825
% hooks observed	85	–	88	–	88
Observed seabirds	8	–	27	–	35
Domestic vessels					
Vessels	44	1	6	0	45
Observed vessels	9	0	1	–	9
% vessels observed	20	0	17	–	20
Total sets	825	9	74	–	908
Observed sets	74	0	6	–	80
% sets observed	9	0	8	–	9
Total hooks x 10^3	957.463	6.370	66.072	–	1029.905
Observed hooks	87.259	0	6.147	–	93.406
% hooks observed	9	0	9	–	9
Observed seabirds	3	0	0	–	3
2006					
Chartered Japanese vessels					
Vessels	2	0	2	0	2
Observed vessels	1	–	2	–	2
% vessels observed	50	–	100	–	100
Total sets	15	–	165	–	180
Observed sets	10	–	165	–	175
% sets observed	67	–	100	–	97
Total hooks x 103	39.160	–	559.100	–	598.260
Observed hooks	21.542	–	499.349	–	520.891
% hooks observed	55	–	89	–	87
Observed seabirds	2	–	13	–	15
Domestic vessels					
Vessels	37	0	5	2	42
Observed vessels	5	–	1	0	6
% vessels observed	14	–	20	0	14
Total sets	734	–	79	2	815
Observed sets	40	–	8	0	48
% sets observed	5	–	10	0	6
Total hooks x 103	826.403	–	71.275	1.400	899.078
Observed hooks	50.302	–	6.881	0	57.183
% hooks observed	6	–	10	0	6
Observed seabirds	12	–	2	0	14

Table 4: Seabird statistics for southern bluefin tuna longline fisheries, 2005 and 2006. Areas are shown in Figure 1.

Area	Total no. hooks (10^3)	% observed	No. observed seabirds	Mean catch rate	Standard error	Estimated no. seabirds caught	*c.v.* (%)
2005							
Chartered Tuna longline fishery: total estimate of 40 seabirds (c.v. = 8%)							
Area 1	137.59	85	8	0.069	0.037	9	21
Area 2	0	–	–	–	–	–	–
Area 3	504.484	88	27	0.061	0.013	31	7
Area 4	0	–	–	–	–	–	–
Domestic Tuna longline fishery: total estimate of 33 seabirds (c.v. = 55%)							
Area 1	952.103	9	3	0.034	0.020	33	55
Area 2	6.37	0	–	–	–	–	–
Area 3	66.072	63	0	0.000	–	–	–
Area 4	5.360	9	0	0.000	–	–	–
2006							
Chartered Tuna longline fishery: total estimate of 18 seabirds (c.v. = 13%)							
Area 1	39.160	55	2	0.093	0.056	4	41
Area 2	0	–	–	–	–	–	–
Area 3	559.100	89	13	0.026	0.010	15	12
Area 4	0	–	–	–	–	–	–
Domestic Tuna longline fishery: total estimate of 218 seabirds (c.v. = 41%)							
Area 1	826.403	6	12	0.239	0.110	197	45
Area 2	0	–	–	–	–	–	–
Area 3	71.275	10	2	0.291	0.189	21	62
Area 4	1.4	0	–	–	–	–	–

Table 5. Seabirds species identified by experts, caught during fishing for southern bluefin tuna in New Zealand waters in 2003 - 2006.

Species	*Scientific name*	*IUCN threat classification*	*Number of seabird caught by year*			
			2003	2004	2005	2006
Antipodean albatross	*Diomedea antipodensis*	Not assessed	4	-	1	1
Buller's albatross	*Thalassarche bulleri*	Vulnerable	17	22	6	6
Black-browed albatross	*Thalassarche melanophris*	Endangered		1		
Campbell albatross	*Thalassarche impavida*	Vulnerable	4	1	6	2
Grey petrel	*Procellaria cinerea*	Near threatened	2	3	2	7
Grey-faced petrel	*Pterodroma macroptera gouldi*	Not assessed	1	-	-	-
Light-mantled albatross	*Phoebetria palpebrata*	Near threatened	-	1	-	-
Southern Royal albatross	*Diomedea epomorphora*	Vulnerable	3	-	-	-
Southern giant petrel	*Macronectes giganteus*	Vulnerable	-	-	2	-
Wandering albatross	*Diomedea exulans*		-	-	-	1
White-chinned petrel	*Procellaria aequinoctialis*	Vulnerable	3	2	2	-
White-capped albatross	*Thalassarche steadi*	Not assessed	1	16	2	1
Westland petrel	*Procellaria westlandica*	Vulnerable	1	1	-	-
Unidentified species			26	24	19	11
Total			62	71	40	29

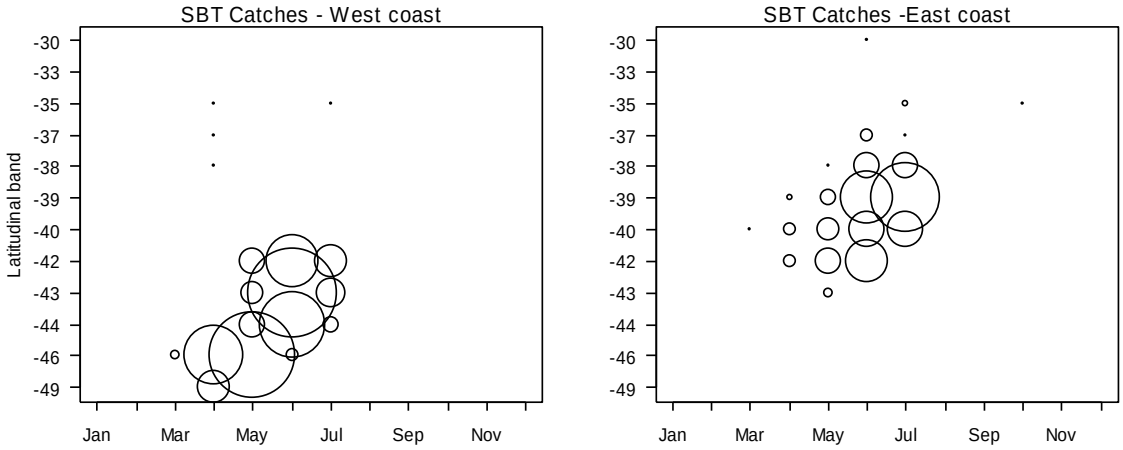

Figure 1: The spatial and seasonal distribution of southern bluefin tuna catches (whole weight) in 2003/04, off the west coast of the South Island and off the east coast of the North Island, New Zealand. The largest circle, (west coast in June) represents 64 t of SBT.

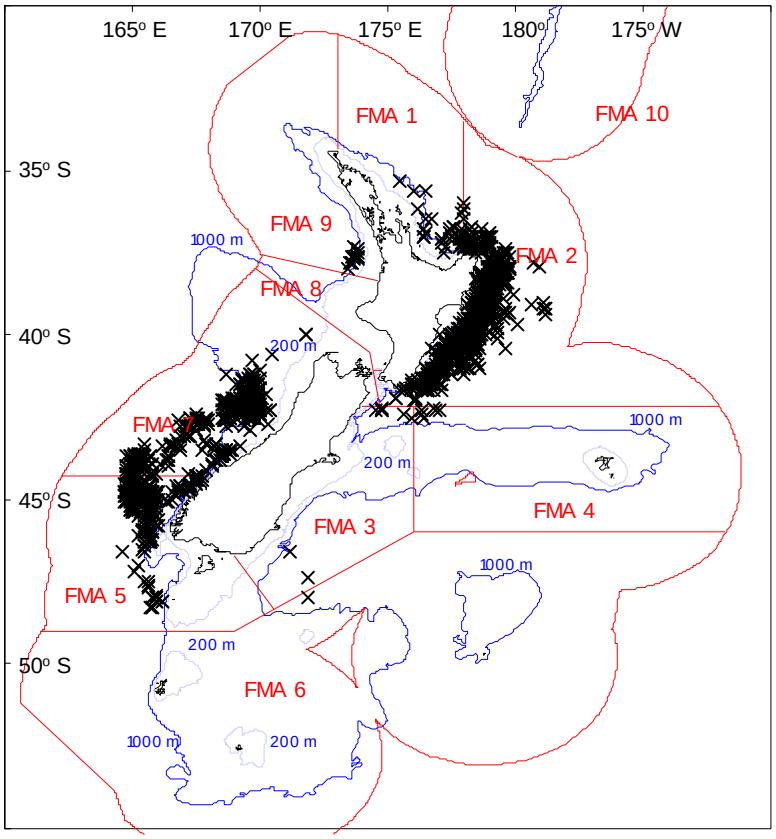

Figure 2. Distribution of longline sets targeting SBT in fishing year 2003/04 (Charter and owner-operated vessels combined).

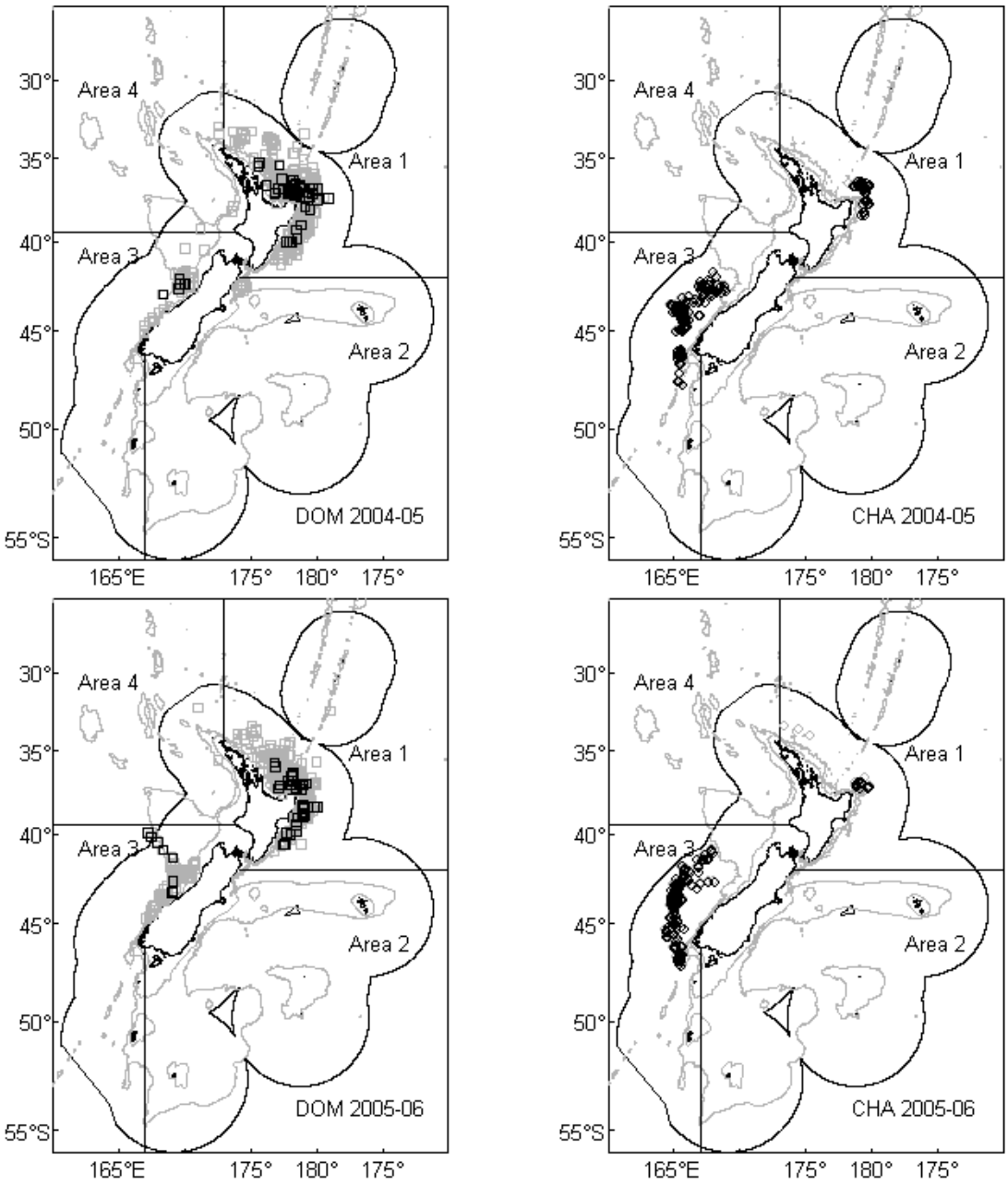

Figure 3: Start positions of commercial sets (grey) and observed sets (black) for domestic vessels (left) and chartered vessels (right) where target was reported as southern bluefin tuna, 2005 (upper) and 2006 (lower).

Appendix – Abstracts of New Zealand Meeting Papers for ERSWG6

DISCUSSION PAPERS

Title **A draft ERS recommendation on measures to reduce seabird bycatch in CCSBT for discussion at CCSBT-ERS-7.**

Authors Delegations of Australia and New Zealand

Abstract Noting the discussions at CCSBT ERS 6 (paragraph 50 of the meeting report) on measures to reduce seabird bycatch in CCSBT fisheries, Australia and New Zealand have further reviewed the draft recommendation developed at that meeting (CCSBT-ERS 6 Attachment 8a). The review highlighted several changes that were needed to develop an effective recommendation. These changes have been strongly endorsed by FAO COFI and UNGA in their work since February 2006. This paper provides rationale for the changes, a revised recommendation for consideration by CCSBT ERS 7 and recommendation to the CCSBT Extended Commission, and documentation of the changes from the ERS 6 resolution.

Title Estimation of seabird captures in fisheries.

Authors Ministry of Fisheries, New Zealand

Abstract The methods used to estimate total non-fish captures for fisheries in New Zealand and in CCAMLR fisheries are described. Varying methods are used, depending on the level of observer coverage, and the representativeness of that coverage. The advantages and disadvantages of three methods are discussed.

Title A draft ERS recommendation on data collection and provision requirements in CCSBT for discussion at CCSBT-ERS-7.

Authors Delegations of Australia and New Zealand

Abstract Noting the discussions at CCSBT ERS 6 (paragraphs 47 - 50) on the provision of advice to the Commission on ERS data collection and provision in CCSBT fisheries, Australia and New Zealand have further reviewed the draft recommendation developed at that meeting (CCSBT-ERS 6 Attachment 7). The review highlighted some changes that were needed to develop a more effective recommendation. These changes have been strongly endorsed by FAO COFI and UNGA in their work since February 2006. This paper provides rationale for the changes, a revised recommendation for consideration by CCSBT ERS 7 and recommendation to the CCSBT Commission, and documentation of the changes from the ERS 6 resolution.

Title A draft ERS recommendation on conservation and sustainable utilisation of sharks taken in SBT fisheries in CCSBT for discussion at CCSBT-ERS-7.

Authors Delegations of Australia and New Zealand

Abstract *To be provided by Australia*

INFORMATION PAPERS

Title The development of reporting forms for reporting ERS data in New Zealand fisheries.

Authors Ministry of Fisheries, New Zealand

Abstract An example of a reporting form for fishers, currently under development for New Zealand national fisheries, is attached. Reporting will be of non-fish and protected species bycatch, and is linked to catch-effort log-book returns.

Title A guide for the identification of ERS species in New Zealand fisheries.

Authors Ministry of Fisheries, New Zealand

Abstract An example of the guide to be used by fishers to code non-fish and protected species captures, currently under development for New Zealand national fisheries, is attached. Reporting will be linked to catch-effort log-book returns. The draft guide and associated form are provided to facilitate discussion by CCSBT-ERSWG of development of reporting requirements for fishers of non-fish bycatch.

Title The resolution on sharks agreed by the WCPFC in 2006.

Authors Delegation of New Zealand

Abstract N/A

Title The resolution on seabirds agreed by the WCPFC in 2006.

Authors Delegation of New Zealand

Abstract N/A